IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: David W. Burns

Application No. 10/710,854

Filed: August 8, 2004

Confirmation No. 4853

For: STYLUS-BASED COMPUTER INPUT SYSTEM

Examiner: Regina Liang

Art Unit: 2629

Attorney Docket No. DWB002

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REPLY BRIEF

Dear Commissioner,

The Applicant submits this Reply Brief under 37 C.F.R § 41.41 to the Board of Patent Appeals and Interferences in response to an Examiner's Answer mailed on 9/14/07.

The $250 fee for the initial appeal brief has previously been paid, along with a $500 fee for an oral hearing. If any additional fees are due at this time, please notify the Applicant promptly.

1. INTRODUCTION

The Applicant has thoroughly read and considered the Examiner's remarks in the Examiner's Answer mailed on 9/14/07. The Applicant appreciates the hard work and professionalism conveyed in the Answer, yet finds the remarks unpersuasive.

The 3-D machine vision stylus-based computer input system of the Applicant has novelty, utility and features not found in the prior art. The telemetric imager of the present invention has a pair of 2-D imaging arrays (or one array with associated optics) that generates images of a stylus such as a pen, pencil, marker or finger, and determines the position (x, y and z) of the stylus tip with respect to a stylus entry region. Active components such as a battery, switches, lights, or circuitry are not required in the stylus of the present invention. As such, even an inexpensive #2 lead pencil, possibly augmented with imaging targets near the writing end or erasing end of the stylus, may serve as an input device. A light near the telemetric imager may illuminate the stylus tip when background lighting is insufficient. Benefits of the invention include the ability to input signatures, handwriting, special characters or drawings directly into a computer system, using the high dexterity of the fingers to move the stylus, rather than having a person's hand splayed out over a conventional computer mouse to unsatisfactorily input even simple artwork like a sketch of the five Olympic rings. While a stylus such as a #2 pencil is not typically outfitted with left, center and right mouse buttons, the machine-vision approach of Burns can interpret movements of the pencil tip in space above a writing surface as well as against the writing surface. A tap, a double-tap, and other stylus motions become the equivalent of right or left mouse-clicks to select icons on a screen or to cause menus to become visible. As disclosed in the present and in co-pending applications, the 3-D approach of Burns allows the position of the stylus tip to be tracked as it hovers above the writing surface to emulate other functions of a conventional computer mouse. Exterior frames, mirrors, collimators, rotating photodetectors, lights, and switches in the stylus are not needed in the approach of Burns, which requires fewer parts and operates differently than any of the prior art.

II. Reply to the Examiner's Response to Argument

The Applicant (also the Appellant, Agent and Inventor) adheres to initial arguments made in the amended appeal brief submitted 6/29/07 (referred to herein as the "appeal brief") and in earlier correspondence, which are not re-stated here for brevity (see in particular Section VI and subsections A-K of Section VII in the appeal brief). Remarks in the reply brief below correspond to the examiner's responses made in Section (10) Response to Argument (pp. 12-20) of the Examiner's Answer mailed 9/14/07. Remarks made in Section (9) Grounds of Rejection (pp. 3-11) of the Examiner's Answer have been previously responded to in the appeal brief, and the Applicant requests that the panel refer to those remarks.

Should the examiner be inclined to respond with a supplemental answer, the Applicant would be pleased to continue this discourse before presentation to the BPAI. A phone call on the matter would be welcomed at any time.

Paragraph 1, Page 12

The Examiner remains in error by continuing to construe that Omura (US Patent 6,594,023) has "means for illuminating a stylus tip with a light source when the stylus tip is in the stylus entry region" as in Claims 31 and 32 of Burns. Omura has a light source in the stylus: "The coordinate inputting unit 65 is formed in a pen-like shape and has the infrared rays LED 64 at a tip end thereof so as to irradiate infrared rays from the infrared rays LED 64 upward" (Fig. 8 and col. 14, lines 55-58). The infrared LED in the stylus of Omura is a source of light. Omura requires a powered LED at the tip end with its associated battery and switch to irradiate infrared light from the coordinate inputting unit. Omura does not teach or anticipate a stylus without a powered LED. The invention of Omura, as disclosed, is unable to determine two-dimensional coordinates without light emanating from an LED at the tip of the coordinate inputting device. The invention of Burns, in contrast, provides for illuminating the stylus tip - a distinctly and patentably different configuration. The invention of Burns provides for an external light source that illuminates the stylus tip, which may be positioned near the telemetric imager (see, for

example, paragraphs 53, 54, 61, 66, and 74 and Figs. 1, 2 and 3 of Burns in published application US 2006/0028457). While the Examiner expresses that "the claim language [of Burns] is very broad and it's anticipated by Omura," the Applicant believes that the claim language is correct and is not anticipated by Omura. The Applicant can find no references within Omura to any "means for illuminating a stylus tip." Omura does not teach or anticipate "illuminating a stylus tip."

Furthermore, the application of Burns does not exclude the possibility of light emanating from the stylus. For example, the last sentence of Para. 49 of Burns states that "additional features may be added to stylus 20, such as self-illuminative targets 22 and 26…."

Regarding other comments by the Examiner in this paragraph, the Applicant acknowledges that the sun or a flashlight are different from the claimed stylus tip and are not part of the claims. These comments were intended by way of analogy to explain language and terms used by the Applicant and others skilled in the art. In response to the Examiner, the Applicant contends that light shines *through* and is *transmitted by* the lens of a flashlight; light is not irradiated from the lens. If the Examiner is perhaps referring to the reflector of a flashlight, then the light from the light bulb is *reflected from* the reflector; light is not irradiated from the reflector. In the case of Omura, infrared light is irradiated from the infrared LED and fails to show "means for illuminating a stylus" as in Burns.

The Omura specification has language translation concerns and must be read carefully in light of inconsistencies. For example, emitted light in Omura is "upward" (col. 14, line 58 of Omura) rather than the correct term "outward." Upwardly directed light would not be detected by the optical units of Omura, since they lie in the plane. Another simple example requiring careful language interpretation based on the context of the technology is the multiple references to "an operating table" (for example, col. 17, line 4). The Applicant holds that when the specification of Omura is read carefully by one skilled in the art and in the context of the technology being described, Omura does not read on "means for illuminating a stylus tip with a light source when the stylus tip is in the stylus entry region" as in Claim 31 and 32 of Burns, and that a 102(b) rejection of Claims 31 and 32 is improper and should be reversed.

Claim 32 of Burns, while worded identically to one of the claim elements in Claim 31, is retained as a placeholder in the expectation that the rejection of Claims 31 and 32 are reversed and that Claim 31 can be allowed in its original form without the inclusion of the limitation expressed by Claim 32, with Claim 32 as a proper dependent claim.

Paragraph 2, Pages 12-14

The Examiner states that the "Appellant has clearly misconstrued and mischaracterized Omura." The Applicant disagrees. The Examiner asserts that Omura clearly reads on "means for generating an image of the stylus tip from a first direction with a single telemetric imager" and "means for generating an image of the stylus tip from a second direction with the telemetric imager" as claimed in Claim 31 and Claim 32 of Burns.

Firstly, Omura does not teach or disclose "generating an image." Omura actually teaches away from generating an image. As described by Omura in col. 15, lines 59-67 and in col. 16, lines 1-7, efforts are made to only detect the "light emitting part of the infrared rays LED 64" and to make "other parts of the coordinate inputting part … black" so that "strong peaks appear…at positions corresponding to the position of the infrared rays LED" that are "detected by the peak detect circuits" and the "resulting peak detection signals…are sent to the calculating circuit." Close inspection of Fig. 9 further supports the intention and actual method of Ogawa not to generate an image, as shown by the two image signal traces and the two peak detect signal traces that have features corresponding only to the spot of light emitted from the infrared LED and are devoid of any other features. The arguments by the Examiner fail to show that Omura generates an image. Omura does not anticipate the claim limitation, and the Examiner's remarks are not persuasive.

Secondly, Omura does not teach or disclose "means for generating an image." Omura uses infrared rays CCD cameras 63a, 63b in much the same way as a scanner does, which is consistent with other embodiments of in-plane light detection or light interruption approaches described throughout the disclosure. This approach of Omura is

in many ways similar to that of a laser barcode scanner in a checkout line, in that lines of the barcode are scanned and detected, although an image of the barcode is not generated.

Furthermore, Omura discloses an *infrared rays* CCD cameras 63a and 63b to detect infrared light emitted from the *infrared rays* LED selectively, further supporting the contention of the Applicant that Omura does not teach or anticipate "means for generating an image" as in Burns.

Thirdly, Omura does not image a "stylus tip." The stylus tip is defined in the specification of Burns as follows: "Stylus tip 18 refers herein to one end or the other of stylus 20 along with the region proximate to the cited end" (Para. 48). The stylus tip that is imaged in Burns, therefore, includes at least one end or the other of the stylus and the *region* proximate to the end, which may include a writing-mode or erasing mode imaging target, or imaging targets such as coded bars, bands or crosses that include information about the stylus tip angle, stylus tip rotation, stylus tip, stylus size, or stylus ink color (Para. 49 of Burns). In contrast, Omura "has the infrared rays LED 64 at a tip end…Thus, an imaging range of the infrared rays position detecting part 62 is set as a two-dimensional coordinate inputting/detecting area 66 and is formed in a plane by the coordinate inputting/detecting member" (col. 14, lines 56-62 and Fig. 8 of Omura). The approach of Burns is different from that of Omura, in that Omura does not teach "generating an image of the stylus tip" including one end or the other of the stylus along with the region proximate to the end. The Examiner has not shown that Omura teaches or discloses "generating an image of the stylus tip." Omura does not anticipate the claimed limitation.

Fourthly, Omura is unable to image a stylus tip. For example, if the infrared rays LED of Omura were turned off, determination of the two-dimensional coordinates would fail, because Omura detects light from the infrared LED to make the determination. The specification or claims of Omura have no references indicating that Omura images the stylus tip. Therefore, Omura does not anticipate "generating an image of the stylus tip."

Fifthly, Omura does not have a telemetric imager as asserted by the Examiner. The telemetric imager of Burns generates images of the stylus tip to determine the stylus position. The infrared rays position detecting part 62 of Omura (col. 14, lines 47-48)

detects infrared rays emitted from infrared rays LED 64, which does not constitute generating an image. Therefore, Omura does not have a telemetric imager.

Furthermore, Omura detects light and determines the coordinates only when in the two-dimensional coordinate inputting/detecting area 66 (col. 14, lines 60-61; also col. 16, lines 18-19). In contrast, the invention of Burns provides for the determination of three-dimensional coordinates (x, y and z). The Examiner seems to unduly discount the three-dimensional (3-D) nature of the Burns' invention and of the utility of imaging the stylus tip including any markings near the writing or erasing end. Fig. 1 of Burns, while predominantly a top view and schematic in nature, renders a 3-D #2 pencil with a single-band imaging target near the writing end and a double-band imaging target near the erasing end. This shows that the telemetric imager fully generates and captures images of the stylus tip, which includes the writing end or erasing end of the stylus and the region proximate to the cited end. In one application of the invention, the pencil with the single-band writing-mode imaging target is positioned near though not touching a writing surface such as a sheet of paper. When detected by the telemetric imager, three-dimensional coordinates (x, y and z) may be determined (paragraphs 68 and 72 of Burns). A mouse icon, such as a pointer, is moved around a computer screen as the stylus tip is moved. When the mouse icon is above a portion of a document such as the signature section of a letter, the stylus tip is placed in contact with the writing surface, and an on-screen graphic is generated that corresponds to movements of the stylus tip while in contact with the writing surface. Reversing the orientation of the stylus and erasing a portion of the writing on the writing surface may be detected and the graphic modified accordingly. In another example, the position of the stylus tip is determined and a mouse pointer is moved around the screen as the stylus is moved in a region above the writing surface. As the pointer is positioned over an icon on the screen, the stylus is tapped downwards once to select or twice to activate the corresponding application, much like a click or a double-click of a conventional computer mouse. In another example, variable width graphics, such as Japanese Kanji characters, are obtainable with the invention of Burns by including special targets near the writing end of the stylus that allow determination of the stylus angle with respect to the writing surface or the rotation of the stylus with respect to a central axis of the stylus. Although not specifically included in

Claim 31 and Claim 32, these features are put forth to further demonstrate to the Examiner and to the panel that significant differences exist between Omura and Burns, and that Omura does not read on or anticipate the claim limitations.

Sixthly, Omura does not teach or disclose "means for generating an image of the stylus tip from a second direction with the telemetric imager," for similar reasons cited in arguments one through five above.

Omura does not read on "means for generating an image of the stylus tip from a first direction with a single telemetric imager" and "means for generating an image of the stylus tip from a second direction with the telemetric imager" as claimed in Claims 31 and 32. For at least the reasons presented above, the rejections to Claims 31 and 32 should be reversed.

Paragraph 3, Page 14

The Applicant disagrees that "Omura clearly teaches 'means for determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region' as claimed in claim 31." Since the approach of Omura does not teach or disclose generating an image, does not teach or disclose means for generating an image, does not image a stylus tip, is unable to image a stylus tip, and does not have a telemetric imager, as argued in the above remarks with respect to Paragraph 2, and since Omura surely does not determine the stylus position based on the generated images, the Examiner remains in error. As described by Omura, "based upon the position of the vertical clock signal 79 from the reset signal 69 and the position of the horizontal clock signal 71, respective two-dimensional coordinates (x1, y1) and (x2, y2) of the coordinate inputting part 65 with respect to the infrared rays CCD cameras 63a and 63b are obtained" (Omura col. 16, lines 30-35). The clock-signal counting approach disclosed by Omura uses vertical clock signals and horizontal clock signals as input from which the coordinates of the coordinate inputting part 65 are obtained (see Omura, col. 16, lines 59-61), *not an image of the stylus tip*. Using clock cycles to determine two-dimensional coordinates does not anticipate "determining the stylus position based on the generated images" as in Burns. Multiple ways to determine the stylus position based on generated images as supported by the specification can be

found on pages 16-17 of the reply brief and in the specification of Burns that show that Omura and Burns are not the same, and that Omura does not anticipate Burns. Omura does not teach "means for determining the stylus position based on generated images from the first direction and the second direction when the stylus tip is in the stylus entry region." Claims 31 and 32 should be allowed.

Furthermore, the stylus entry region of Burns is not anticipated by Omura. According to Burns: "Stylus entry region 50 corresponds to a region where stylus position 12 of stylus 20 is capable of being determined such as, for example, a bounded physical surface and the region above the physical surface" (Para. 48 of Burns). Images of the stylus tip are generated when the stylus tip is in the volume corresponding to the stylus entry region. Omura does not teach this. The approach of Omura relies on light detection or light interruption *in a plane*, not in a stylus entry region (3-D) as in Burns. The Examiner fails to show that Omura teaches or anticipates determining the stylus position "when the stylus tip is in the stylus entry region."

Paragraph 4, Page 15

The Examiner asserts that "Omura does disclose and anticipated the claimed limitations under 35 USC 102(b)." The Applicant respectfully disagrees as stated above in the remarks to the first three paragraphs. The Applicant asserts that neither the disclosure nor the claims of Omura anticipate the claimed invention, even though the claims of Omura are written obscurely and evasively without the clear, concise and exact terms required by 35 USC § 112 (for further discussion, see remarks bridging pages 17 and 18 of the appeal brief). The Examiner has not shown that the invention of Burns was patented or described or in public use or on sale in this country by Omura, and Claims 31 and 32 should be allowed.

Paragraph 5, Page 15

The Examiner asserts that a 102(b) rejection has been correctly asserted against Claims 31 and 32, since all of the four claim elements: "means for illuminating a stylus tip with a light source when the stylus tip is in the stylus entry region," "means for generating an image of the stylus tip from first direction with a single telemetric imager,"

"means for generating an image of the stylus tip from a second direction with the telemetric imager," and "means for determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region" are supported and disclosed by Omura. The Applicant respectfully disagrees with the Examiner with respect to all four claim elements. Omura does not anticipate "means for illuminating a stylus tip with a light source when the stylus tip is in the stylus entry region." Omura has neither patented nor described "means for generating an image of the stylus tip from a first direction with a single telemetric imager" or "means for generating an image of the stylus tip from a second direction with the telemetric imager." Omura neither supports nor discloses "means for determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region." Furthermore, Omura does not disclose or teach a "stylus entry region." For the reason that none of the four claim elements have been anticipated by Omura, and that for at least the reason that one or more of the four claim elements have not been patented or described by Omura, the 102(b) rejection of Claims 31 and 32 should be reversed.

Paragraph 6, Page 15

The Applicant recognizes that remarks regarding Ogawa (US Pat. 6,100,538) on pages 19-23 are moot in the current situation since Claims 31, 32 are rejected under 35 USC §102(b) by Omura in the Final rejection, not by Ogawa. The Applicant wishes to have these remarks remain in the record, however, as these claims were twice rejected finally under 102(b) in earlier office actions before an RCE was filed and have impact provided a favorable review is made of the claim language. Should there be reconsideration by the Examiner, the modifier "single" in "single telemetric imager" as in Claim 31 is requested to be considered as irrelevant and be removed from the claim, as discussed in questions three and four on pages 18 through 23 of the appeal brief.

Paragraph 7, Pages 15-16

In response to the Applicant's remarks in Section VII-B of the appeal brief, the Examiner claims to have set forth proper motivation to combine the references of Omura

and Ogawa (US Pat. 6,100,538) and claims that since the appellant has not rebutted the motivation, the rejection is submitted to be proper. The Applicant fails to see where this is the case. As stated in the first paragraph of page 28 of the appeal brief: "… no suggestion or motivation has been expressed to modify or combine the references for a proper 103(a) rejection…."

The Applicant still believes that the Examiner is in error by rejecting Claims 1, 2, 4, 6, 11-13, 15, 16, 18, 20, 21, 23, 26, 27, 29, 30, 35 and 36 under U.S.C. § 103(a) as being unpatentable over Omura in view of Ogawa. Firstly, the inventions of Omura and Ogawa, while trying to solve some of the same problems as Burns (entry of data into a computer), do so in a significantly different way. Secondly, the claim elements are different in the invention of Burns compared to those of either Omura or Ogawa. Thirdly, the claim elements are fewer in the invention of Burns compared to those of either Omura or Ogawa (as well as any combination of the two inventions). With five searches having been completed (one by the Applicant and four by the Examiner) and with no evidence that the system is being commercially sold, the Applicant continues to believe that he is the first and sole inventor of the invention as claimed. To avoid extensive recitation of arguments regarding the rejection of Claims 1, 2, 4, 6, 11-13, 15, 16, 18, 20, 21, 23, 26, 27, 29, 30, 35 and 36 under U.S.C. § 103(a) as being unpatentable over Omura in view of Ogawa, the panel is directed to Section VII-B (pp. 23-29) of the appeal brief.

The rejections to Claims 1, 2, 4, 6, 11-13, 15, 16, 18, 20, 21, 23, 26, 27, 29, 30, 35 and 36, in original and amended form, should be reversed.

Paragraph 8, Page 16

The Applicant continues to assert that Omura does not have a telemetric imager, that none of the embodiments of Omura has a telemetric imager, that a telemetric imager is not found in any of the figures of Omura, and that a telemetric imager is not claimed by Omura. While the Examiner states: "It is clear that Omura's Fig. 8 is identical to appellant's Fig. 1" (Examiner's answer, page 16), the Applicant does not agree. Fig. 8 of Omura has an infrared rays LED 64, two infrared CCD cameras 63a and 63b, peak detect circuits 76a, 76b, vertical clock circuit 74 and horizontal clock circuit 75, and other

elements, so that the light irradiated from infrared rays LED 64 can be detected and the position of coordinate input unit 65 may be determined. Fig. 1 of Burns has a stylus 20 with a stylus tip 18 having an imaging target 22 near a writing end 24, a telemetric imager 30, and a controller 40 to provide stylus information output 46 through a wired or wireless port communication port 48. In this embodiment of Burns, images are made of the stylus tip with two optical imaging arrays 32a and 32b, the images including the single-band imaging target 22 or a double-band imaging target 26 near an erasing end 28 when the stylus 20 is reversed. Contrary to Omura, images are generated from two directions, and the stylus position 12 is determined based on the images. The stylus in Fig. 1 of Burns clearly shows the region near the end of stylus 20 that is imaged; it includes the stylus end and the region proximate to the stylus end that may include an imaging target such as single-band writing-mode imaging target 22 or a double-band erasing-mode imaging target 26. Fig. 8 of Omura shows no such features and does not suggest that any portion of the stylus other than light from infrared rays LED 64 at a tip end is used to determine the coordinates of coordinate inputting part 65. There is no LED in the stylus of Burns (a completely passive stylus will suffice), although a light source 60 positioned near the telemetric imager 30 may be used to illuminate the stylus 20 if ambient light is insufficient. Omura differs from Burns in at least that the approach of Omura detects the light emitted from the infrared rays LED, and uses peak detection and clock-signal counting circuitry to determine the position of the coordinate inputting unit, whereas Burns generates images and determines the stylus position based on the generated images. The approach of Omura *never generates an image of the stylus tip*, nor does Omura determine the stylus position based on generated images. If the infrared rays LED of Omura were not irradiating infrared rays, for example, the approach of Omura would not find a peak and would be unable to calculate the coordinates of the coordinate inputting part. Thus, Omura does not teach or suggest determining "the stylus position based on a generated image of the stylus tip" as in Claim 1 of Burns.

Furthermore, Omura does not suggest illuminating the stylus tip, as in Claim 1 of Burns.

Furthermore, Omura does not suggest a telemetric imager as in Claim 1 of Burns, because a telemetric imager generates images of the stylus tip that are used to determine the position of the stylus tip.

Furthermore, Omura does not teach using only one imaging array as is asserted in Claim 1 of Burns. The Examiner asserts that "the two CCD cameras 63a, 63b in a single position detect part 62 of Omura clearly read on 'a single telemetric imager having *an* optical imaging array' as claimed" (emphasis added), which is disputed by the Applicant. See, for example, Para. 51 of Burns, wherein "telemetric imager 30 may include single optical imaging array 32, as illustrated in Fig. 3, to generate images of stylus tip 18 from first direction 14 and second direction 16" (see also the last sentence of Para. 77, among others).

For at least these reasons, the rejection of Claim 1 and all the claims that depend thereon (Claims 2-19), along with corresponding method Claim 20 and dependent Claims 21, 23, 26, 27, 29 and 30, along with Claims 35 and 36, should be reversed.

Paragraph 9, Pages 16-17

Table 2 and associated text of the appeal brief have been put forth to show that the invention of Burns is different from that of Omura, that of Ogawa, and the combination thereof, as an attempt to summarize the essential differences, not as an attempt to avoid the prior art.

Other arguments in defense of the claims can be found in Section VII-B of the appeal brief.

Paragraph 10, Page 17

The Examiner claims that "Ogawa teaches a light source can be alternatively positioned in the stylus or near the detecting unit (telemetric imager), and positioning the light source near the telemetric imager would enhance the illumination efficiency and prevent the undesired reflective light of the stylus caused by extraneous light from entering into the detecting units (col. 16, lines 24-27 of Ogawa). The examiner asserts that a proper motivation has been given to combine the references and the rejection is proper." Quite the contrary. A closer reading of that passage shows that the

enhancement suggested by Ogawa comes not from placing the light source near the optical digitizer of Ogawa, but from a "recursive retroreflecting member 22t…. For the retroreflecting member 22t, many minute corner cube prisms for example may be used. These prisms are an extremely efficient retroreflecting member, so that the light-emitting intensity of the light source 31 can be saved" (Ogawa, col. 16, lines 17-24). Therefore, the Examiner has not established a motivation to combine the references, and the rejection of Claim 1 and all the claims that depend thereon (Claims 2-19), along with Claims 20, 21, 23, 26, 27, 29, 30, 35 and 36, should be reversed.

Paragraph 11, Page 17

The Examiner continues to reject Claim 20 of Burns "since Claim 20 is a method claim corresponding to the apparatus Claim 1, and is rejected for the same reasons…." Claim 20 is also a method claim corresponding to Claims 31, 32. For the same reasons cited in the remarks to Paragraphs 1-5, and 7-10 above and the corresponding remarks in the appeal brief (see for example, page 28 of the appeal brief and references therein), the rejection by the Examiner of Claim 20 should be reversed.

Paragraph 12, Page 17

The Examiner contends that "Omura discloses all of the limitations as claimed in Claim 31," and that "the combination of Omura and Tsuji (US 2001/0020936) renders Claim 37 obvious." The Applicant asserts that the Examiner is in error, because neither Omura nor Tsuji (nor Ogawa) have "means for illuminating a stylus tip with a light source when the stylus tip is in the stylus entry region; means for generating an image of the stylus tip from a first direction with a single telemetric imager; means for generating an image of the stylus tip from a second direction with the telemetric imager; and means for determining the stylus position based on the generated images from the first direction and the second direction when the stylus tip is in the stylus entry region" as argued in the response to Paragraphs 1-6 and 7-10 above and the corresponding remarks in the appeal brief (see for example, Section VII-C of the appeal brief and references therein). The rejection by the Examiner of Claim 37 should be reversed.

Paragraph 13, Pages 17-18

The Examiner continues to reject Claims 3, 8-10 and 28 as obvious because "Omura does teach a single telemetric image as claimed and Omura as modified by Ogawa teaches all the limitations as claimed in claims 1 and 20. Thus the combination of Omura, Ogawa and Tsuji renders claims 3, 8-10 and 28 obvious." The applicant is not persuaded, and for the same reasons cited in the remarks to Paragraphs 1-5 and 7-10 above and the corresponding remarks in the appeal brief (see for example, Section VII-D on pages 29-30 of the appeal brief and references therein), the rejection of Claims 3, 8-10 and 28 by the Examiner should be reversed.

Paragraph 14, Page 18

The Examiner contends that "Omura discloses all the limitation as claimed in claim 31. Thus, the combination of Omura and Brown renders claim 34 obvious." The Applicant disagrees as stated above in the response to Paragraphs 1-5 and 7-10 above and other remarks in Section VII-E (page 30) of the appeal brief, and the rejection of Claim 34 should be reversed.

Paragraph 15, Page 18

The Examiner asserts that "Omura as modified by Ogawa teaches all the limitation as claimed in claims 1 and 20. Thus, the combination of Omura, Ogawa and Brown renders claims 3, 8-10 and 28 [sic] obvious." The Applicant believes that the Examiner refers to and rejects Claims 5 and 25 based on the combination of Omura, Ogawa and Brown. The Examiner relies on a mercury switch in the light pen of Brown to "teach a stylus has a writing mode at one end of a stylus and an erasing mode at another end of the stylus" and that "the combination of Omura, Ogawa and Brown would have a stylus having a write mode at one end and an erasing mode at another end." The use of a mercury switch, aside from its blatant environmental concerns, would not have been suggested by anyone skilled in the art at the time of the invention or today to serve as a "writing-mode imaging target near a writing end of the stylus" as in Claim 4, or to serve as an "erasing-mode imaging target near an erasing end of the stylus" as in Claim 5, or for "determining one of a writing mode or an erasing mode when the stylus tip is in

the stylus entry region" as in Claim 25. A mercury switch serves as a binary inclinometer, and with the application of gravity will open or close the switch based on whether the switch is oriented upwards or downwards. The mercury switch is internal to the stylus of Brown and therefore not visible from the outside for generating images thereof. Even if the switch were visible to the outside, markings on the switch body would be needed so that it could be identified as an imaging target. These markings would need to be near each end of the stylus, making the mercury switch unduly long. As a gravity-dependent device, a stylus incorporating it would mistakenly identify an erasing end for a writing end when the user was writing, for example, on a vertically mounted white board or while on one's back. The imaging targets of Burns correctly assuage these detriments, and furthermore eliminate the need for a switch, batteries, wiring and indeed anything active in the stylus. For at least these reasons and for the same reasons cited in the remarks to Paragraphs 1-5 and 7-10 above and the corresponding remarks in the appeal brief (see for example, Section VII-F on pages 31-32 of the appeal brief and references therein), the rejection by the Examiner of Claims 5 and 25 should be reversed.

Paragraph 16, Page 19

As stated by the Examiner in the first paragraph of page 19, "Omura as modified by Ogawa teaches all the limitation as claimed in claims 1 and 20. Thus, the combination of Omura, Ogawa and Inabata (US Pat. 5,245,175) renders claims 7 and 22 obvious." For at least the reasons set forth in the replies to Paragraphs 1-5 and 7-10 above and in Section VII-G on page 32 of the appeal brief, the Applicant disagrees. The rejections of Claims 7 and 22 should be reversed.

Paragraph 17, Page 19

According to the Examiner regarding the combination of Omura, Ogawa and McDermott (US Pat. 5,635,683), the Examiner contends that "Omura as modified by Ogawa teaches all the limitation as claimed in claim 1. Thus, the combination of Omura, Ogawa and McDermott renders claim 17 obvious." The Applicant continues to assert that the Examiner is in error, because neither Omura nor Ogawa nor McDermott have "a

single telemetric imager having an optical imaging array; a light source positioned near the telemetric imager to illuminate a stylus tip; and a controller electrically coupled to the telemetric imager; wherein the controller determines the stylus position based on a generated image of the stylus tip from a first direction and a generated image of the stylus tip from a second direction when the stylus tip is in a stylus entry region" as in the currently pending Claim 1 of Burns or as in the original Claim 1 of Burns without the light source. Since Claim 17 is dependent on Claim 1, then for at least the reasons cited in the replies to Paragraphs 1-5 and 7-10 above and in Sections VII-A, VII-B and VII-H of the appeal brief, the rejection by the Examiner of Claim 17 should be reversed.

Paragraph 18, Page 19

In the third paragraph on page 19 of the Examiner's reply regarding the combination of Omura, Ogawa and Yoshida (US Pat 5,401,917), the Examiner contends that "Omura as modified by Ogawa teaches all the limitation as claimed in claim 1. Thus, the combination of Omura, Ogawa and Yoshida renders claim 19 obvious." The Applicant disagrees as stated above in the response to Paragraphs 1-5 and 7-10 above and other remarks in Section VII-I (page 33) of the appeal brief, and the rejection of Claim 19 should be reversed.

Paragraph 19, Pages 19-20

Regarding Claim 40, the Examiner has found the remarks in Section VII-K (pages 35-36) of the appeal brief unpersuasive regarding the combination of Segen (US Pat. 5,484,966) and Griffin (US Pat. 4,553,842). The Applicant contends that Segen does not have a telemetric imager, that Segen does not have a light source to illuminate a stylus tip, and that Segen does not determine the stylus position based on generated images of the stylus tip. The telemetric imager of Burns generates images of the stylus tip, the stylus tip including one end or the other of the stylus along with the region proximate to the cited end (Para. 48 of Burns). The apparatus of Segen teaches away from Burns in that a one-dimensional image sensor is used (i.e. the patent title among others), which intrinsically does not image a region. Segen teaches away from Burns in that Segen uses mirrors. Segen makes no statements about mirrors being optional, and does not

anticipate Burns, who generates images of the stylus tip from two different directions. Segen also teaches away from Burns in the number of images needed to determine the stylus position. Segen includes two reflecting surfaces that, when combined with the stylus, result in four images in the preferred embodiment (Segen, col. 5, lines 22-27). An acute mirror angle can result in five images detected by the sensing device (Segen, col. 11, lines 11-18). An obtuse mirror may result in only three (Segen, col. 11, lines 5-8). Segen does not suggest or teach determining "the stylus position based on a generated image of the stylus tip from a first direction and from a generated image of the stylus tip from a second direction" (two images) as in Claim 40 of Burns. Burns does not use mirrors as in Segen.

Segen also teaches away from "determining the stylus position based on a generated image of the stylus tip" as in Claim 40, because in addition to the length of the mirrors being "long enough to ensure that all reflection of a stylus 108, positioned in an active area 106, reach the sensing device 110" (Segen col. 4, lines 20-22), that "the height of the mirrors 102, 104 can be small because the viewing plane 116 defining the active area 106 is perpendicular to the reflecting surface of each mirror" (Segen, col. 4, lines 23-25). Other references are made to the determination of the position of a stylus in a two-dimensional plane (not a volumetric region) using a one-dimensional sensing device (Segen, col. 3, lines 49-52; col. 4, lines 41-44; col. 5, lines 36-39 and others).

The Examiner uses Griffin (US Pat. 4,553,842) to teach a light source near the detector, though Griffin also uses mirrors and retroreflective surfaces outside of a target zone – one long, flat mirror on one side, a series of offset retroreflective segments on another side, and a curved retroreflective surface on a third (Griffin, col. 3, lines 40-46. The approach of Griffin uses a light source near a spinning photodetector to generate shadows of an opaque object in the target area and to detect the opaque object by looking for the "interruptions of light paths dispersed across the target zone" (Griffin, col. 2, lines 27-30; also col. 4, lines 19-21; col. 5, lines 14-21; col. 6 lines 11-16), teaching away from "illuminating a stylus tip and generating images of the stylus tip" as in Burns, among others.

Thus, neither Segen or Griffin nor the combination thereof teaches, shows, suggests or anticipates Claim 40 of Burns. Reversal of the Examiner's rejection of Claim 40 is respectfully requested.

Request for Clarification

The Examiner states on page 2 of the Examiner's answer mailed 9/14/07 that "The appellant's statement of the grounds of rejection to be reviewed on appeal is correct except for item J the rejection of claims 14, 24 and 33 is withdrawn and the claims are objected to as being allowable." The Applicant does not understand why item J is not correct and does not understand what the second half of the sentence means. Clarification is requested.

Office Communication of 10/17/2007

The Applicant acknowledges the receipt of a communication from the Examiner mailed 10/17/07 indicating that the evidence relied on in the Examiner's answer was incorrectly listed as Griffin (4,533,842) rather than Griffin (4,553,842).

III. Summary and Conclusion

For at least the reason that Omura, Ogawa and all other cited references fail to use images of the stylus tip including a region near the end in determining the position of the stylus, the invention of Burns is novel, inventive and has utility. None of the references cited by the Examiner, either alone or in combination, describe, anticipate, teach, show or suggest the claimed subject matter. For at least these reasons, the Applicant respectfully submits that all claims in the application define over and are neither anticipated nor made obvious by the cited art and that Claims 1-40 herein fully satisfy the requirements of 35 U.S.C. §§ 102, 103 and 112 and are patentable over the references. The Applicant respectfully requests reversal of all rejections and prompt passage to issue of Claims 1-40, or preferably the original Claims 1-39 along with paid-up Claim 40.

If any questions remain that may be resolved through a personal or telephonic interview or if any of the contents of this Reply Brief could be discussed, the Examiner or members of the Board are encouraged to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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